1. Mount the PVS5x
   1. Select an installation location that is not in direct sunlight.
   2. Mount the PVS5x bracket using appropriate hardware for the mounting surface and in locations that can support 6.8 kg (15 lbs).
   3. Fit the PVS5x onto the bracket until the mounting holes at the bottom are aligned.
   4. Use a screwdriver to secure the PVS5x to the bracket using the provided screws. Do not overtighten.

2. Wire the PVS5x power
   **Danger!** Hazardous voltages! Do not power up the system until you complete Sections 1 through 3. Accessing the system involves possible contact with potentially lethal voltages and currents. No attempt to access, install, adjust, repair, or test the system should be made by anyone who is not qualified to work on such equipment.
   1. Use a screwdriver—to prepare the PVS5x for AC wiring:
      • Loosen the three captive screws on the bottom of the PVS5x enclosure and remove the cover.
      • Remove the lower AC wiring cover.
      • Remove the upper AC wiring cover.
      • Rip the AC wiring partition to the opposite side of where your AC wiring will be incoming.
   **Warning!** Do not use the AC wiring partition to secure cables or wiring.
   2. Run power conduit from the service panel to the PVS5x. If you use the rear conduit opening, use the included hole plugs.
   3. Connect the PVS5x to either a 15 A (with 14 AWG) or a 20 A (with 12 AWG) U.L. Listed dedicated dual-pole breaker.
   **Note:** For AC modules, this breaker should be in the same service panel containing the AC operating circuits.
   4. Strip wires and land according to the color-coded labels (black wire to L1, red wire to L2, white wire to N, and green wire to GND) in the junction terminals on the bottom, left of the PVS5x board. Tighten to 0.5–0.6 Nm (4.4–5.3 in-lb).
   **Caution!** Do not overtighten terminals.

3. Install and wire the consumption CTs
   **Danger!** Hazardous voltages! Do not power up the system until you complete Sections 1 through 3. Accessing the system involves possible contact with potentially lethal voltages and currents. No attempt to access, install, adjust, repair, or test the system should be made by anyone who is not qualified to work on such equipment.
   The SunPower-provided CTs are suitable for use on 200 A conductors. CTs may be labeled “100 A” but this is a calibration reference rating only. You may install CTs in parallel or bundled configurations. **Refer to the Consumption Meter CT Installation Instructions.**
   1. Turn off all power to the main service panel in which you are installing CTs.
   2. Place the CTs in the main service panel, around incoming service conductors, with the side labeled THIS SIDE TOWARD SOURCE toward the utility meter and away from the loads. Never install CTs in the utility-designated section of the service the panel.
   3. Place L1 CT (black and white wires) around incoming Line 1 service conductor.
   4. Place L2 CT (red and white wires) around incoming Line 2 service conductor.
   5. Align the steel core pieces and snap the CTs closed.
   6. Route CT wires through conduit to PVS5x.
   **Running CT wires:** You may run CT and AC wiring in the same conduit. Do not run CT wiring and internet communication cables in the same conduit.
   **Extending CT leads:** Use Class 1 (300V rated minimum, 16 AWG maximum) twisted-pair instrument cable and appropriate connectors; SunPower recommends the use of silicone-filled connectors (IDC) or telecom crimps; do not use power cables for (example, THWN or Romex) to extend the leads.

4. Verify CT Voltage Phases
   1. Turn on power to the PVS5x.
   2. Use a voltmeter to measure voltage between the PVS5x L1 terminal and the L1 incoming service conductor in the main service panel with the L1 CT in place.
   3. If the voltmeter reads:
      • 0 V, the phases are correctly aligned.
      • ±240 V the phases are incorrectly aligned. Move the CT to the other incoming service conductor and retest to verify.
   4. Repeat Steps 2.4 and 2.3.

5. Connect the system communication
   1. Replace the upper AC wiring cover.
   2. Replace the lower AC wiring cover over the AC power wires (on the left if you ran left through left; on the right if you ran through the right hole).
   3. Run communication conduit to the PVS5x conduit opening. If you use the rear conduit entrances, seal the holes on the bottom of the enclosure with the included hole plugs.
   **Caution!** Never run inverter cables in communication cable in same conduit as AC wiring.

6. Connect the PVS5x to the internet
   **Connect to customer’s Internet using either:**
   - Ethernet cable from PVS5x LAN2 to customer's router (recommended method)
   - USB line EA: to customer’s router (optional accessory available from SunPower)
   - Customer’s Wi-Fi network: connect during commission (Section 6) using customer’s Wi-Fi network name and password

7. Commission with the PVS Management App
   1. Turn laptop Wi-Fi off.
   2. Use an Ethernet cable to connect your laptop to either the PVS5x or the inverter based on inverter type:
      • AC module or SMA US-22: Connect laptop to PVS5x LAN1 port.
      • SMA US-40 inverter: Connect laptop to available communication port (A or B) in the last (only) inverter.
   3. Open a browser (latest version of either Chrome or Firefox) and type: www.sunpowerconsole.com
   4. Follow the PVS Management App onscreen instructions.

5. Land L1 CT and L2 CT wires in corresponding CONS L1 and CONS L2 in the J16 terminals on the bottom, right terminals of the PVS5x board. Tighten to 0.5–0.6 Nm (4.4–5.3 in-lb). Strip leads, strip no more than 6 mm (1/4in).

6. Connect the PVS5x to the internet
   **Connect to customer’s Internet using either:**
   - Ethernet cable from PVS5x LAN2 to customer’s router (recommended method)
   - USB line EA: to customer’s router (optional accessory available from SunPower)
   - Customer’s Wi-Fi network: connect during commission (Section 6) using customer’s Wi-Fi network name and password

7. Commission with the PVS Management App
   1. Turn laptop Wi-Fi off.
   2. Use an Ethernet cable to connect your laptop to either the PVS5x or the inverter based on inverter type:
      • AC module or SMA US-22: Connect laptop to PVS5x LAN1 port.
      • SMA US-40 inverter: Connect laptop to available communication port (A or B) in the last (only) inverter.
   3. Open a browser (latest version of either Chrome or Firefox) and type: www.sunpowerconsole.com
   4. Follow the PVS Management App onscreen instructions.
   5. Replace the PVS5x enclosure cover and use a screwdriver to tighten the three screws on the bottom of the enclosure.

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**FCC Compliance**

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. (This device does not cause harmful interference, and)
2. (This device must accept any interference received, including interference that may cause undesired operation.)

**NOTE:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the manufacturer's instructions to daisy-chain additional SMA US-22 inverters.

**Customer’s Wi-Fi network:** connect during commission (Section 6) using customer’s Wi-Fi network name and password

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**Safety & Certifications**

**Safety Instructions**

- Tool usage: All tools used within this guide should be performed only by qualified, trained personnel with the necessary skills and knowledge to work on this type of electrical device.
- Field service is limited to the components contained in the lower compartment of the enclosure.
- Perform all electrical installations in accordance with any national and local codes, such as the National Electrical Code (NEC) ANSI/NFPA.
- The tools and equipment outlined in this guide are the only ones recommended by SunPower to do any work on the PVS5x. It is vital to use the correct tool for the job.
- **Before connecting power, the PVS5x must be securely mounted to an inside or outside wall following the instructions in this document for electrical safety code compliance.** Connect the PVS5x to a dedicated U.L. Listed AC indoor breaker using 14 AWG wiring or a U.L. Listed 20-A rated breaker using 12 AWG wiring or a U.L. Listed 20-A rated breaker using 12 AWG AC wiring. The input operating current is less than 0.1 amp with AC nominal voltages of 240 VAC (L1–L2).
- **The PVS5x contains an internal surge protection for connection to the load side of the service entrance AC panel.** For installations in areas at risk of surges generated by high-voltage utilities, industry, or by lightning, it is recommended that a Surge Protection Device (SPD) be installed on the PVS5x input.
- **Caution!** Do not attempt to repair the PVS5x. Tampering with or opening the upper compartment voids the product warranty.

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**Certification**

- **UL Listed:** UL Listed 9100/1/100 and UL9450-220 for indoor use.
- **The PVS5x is not a utility meter, Disconnect device, or power distribution device.**

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**Changes or modifications not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment.** This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter except in accordance with FCC transmitter product compliance.
Follow these instructions to install, configure, and commission the PVS Supervisor 5x (PVSSx) to begin receiving monitoring data. Refer to the PVSSx Installation Instructions on the other side for the complete PVSSx installation instructions.

**PVSSx Quick Start Guide**

Routing wire and cable:
- Fill all openings in the enclosure with components rated Type 4 or better to maintain the integrity of the enclosure’s environmental system.
- Drill extra openings with appropriate knockout tools (do not use screwdriver and hammer).
- Use only the provided conduit openings or knockout locations and never cut holes in the top or sides of the enclosure.
- Never run inverter or Ethernet communication cable in the same conduit as AC wiring.
- CT and AC wiring may be run in the same conduit.

1. Mount the PVSSx
   - Mount PVSSx bracket using hardware that supports 6.8 kg (15 lbs) and use screwdriver to secure the PVSSx to bracket using provided screws.

2. Remove all PVSSx covers
   - Use screwdriver to remove enclosure and AC wiring covers.

3. Wire PVSSx power
   - Install a dedicated 240 or 208 VAC circuit. Flip AC wiring partition to opposite side of incoming AC wiring. Land wires in J5 terminals: black to L1, red to L2, white to N, and green to GND.

4. Install consumption CTs
   - Refer to Section 3 on the other side for complete CT installation instructions.

5. Wire consumption CTs
   - Land wires in J5 terminals: L1 CT (black and white wires) around Line 1 and L2 CT (red and white wires) around Line 2.

6. Replace PVSSx wiring covers
   - Use screwdriver to replace AC wiring covers over AC power wires.

7. Connect DC inverter communication
   - If DC inverter is installed, connect communication from DC inverter to PVSSx. No additional connection is required for AC modules.

8. Connect PVSSx to the internet
   - Connect to customer’s internet with either:
     - Ethernet Cable: From PVSSx LAN2 to customer’s router (recommended method).
     - PLC Adapter (optional SunPower accessory): To customer’s router.
     - Customer’s Wi-Fi: Connect during commissioning with network and password.

9. Communication with PVSS Management App
   - Note: For sites with SMA US-40 DC inverter, connect Ethernet cable from port A or B in the last (or only) inverter.

10. Replace PVSSx cover
    - Use screwdriver to replace enclosure cover.

**PVSSx Connection Diagram: AC Module Site**

**PVSSx Connection Diagram: DC Inverter Site**

**PVS5x Installation Instructions and Quick Start Guide**